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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 4 :		(11) International Publication Number:
B65G 67/02	A1	WO 88/ 08403
		(43) International Publication Date: 3 November 1988 (03.11.88)

(21) International Application Number: PCT/GB88/00307

(22) International Filing Date: 21 April 1988 (21.04.88)

(31) Priority Application Numbers: 8709538
8711001
8801641

(32) Priority Dates: 22 April 1987 (22.04.87)
8 May 1987 (08.05.87)
26 January 1988 (26.01.88)

(33) Priority Country: GB

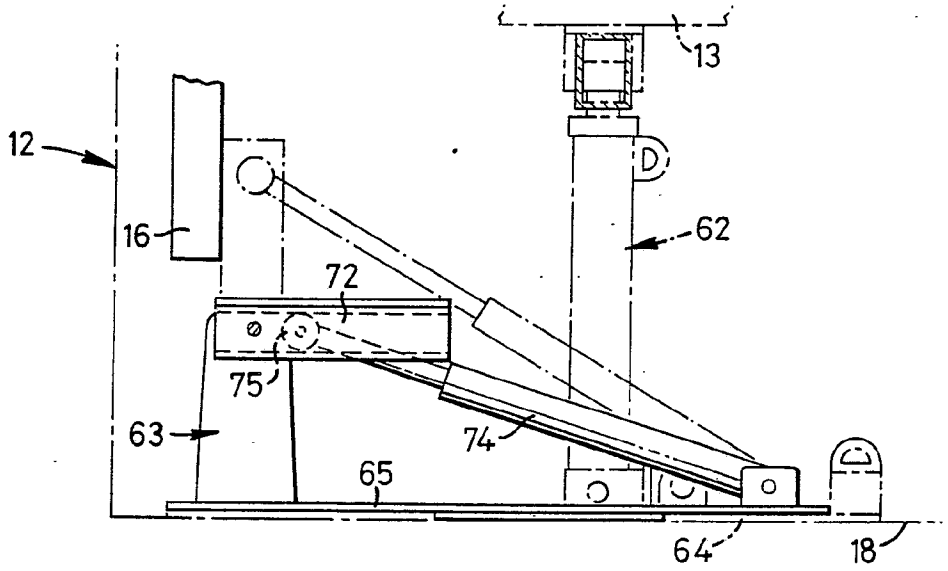
(71)(72) Applicant and Inventor: HARRIS, Anthony, Michael [GB/GB]; 86 Farnborough Road, Heath End, Farnham, Surrey GU9 9BE (GB).

(74) Agents: ROGERS, Jack et al.; F.J. Cleveland & Company, 40-43 Chancery Lane, London WC2A 1JQ (GB).

(81) Designated States: AT (European patent), AU, BE (European patent), CH (European patent), DE (European patent), DK, FR (European patent), GB (European patent), IT (European patent), JP, KR, LU (European patent), NL (European patent), NO, SE (European patent), SU, US.

Published
With international search report.

(54) Title: COMMERCIAL VEHICLE LOCATING SYSTEM



(57) Abstract

A system for supporting and maintaining a vehicle cargo platform (13) at a desired level for loading/unloading comprises a levelling jack arrangement (62) and a separate stop arm arrangement (63) which are mounted on a loading bay road surface (18). They are collapsible to allow the crash bar (16) of a vehicle to passover them as the vehicle is backed into and driven out of the loading bay (12). The jack arrangement (62) is pivotally mounted and has striker arms which are abutted by the crash bar (16) as the vehicle is backed over it, so that it is raised into position to be extended to raise the platform (13) to the level of the loading surface and hold it there. The stop arm arrangement (63) has a pivotally mounted arm (72) which is movable against the front of the crash bar (16), when the jack arrangement (62) is raised, and held there by a hydraulic cylinder (74) to lock the vehicle against movement out of the loading bay (12). The system also comprises a bridging plate and a vertically sliding buffer arrangement.

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DESCRIPTION

COMMERCIAL VEHICLE LOCATING SYSTEM

This invention relates to a system for supporting and maintaining a cargo-support platform of a commercial vehicle or trailer at a desired level for loading or unloading.

There is a wide variation of vehicle bed heights between different vehicles. Also the bed height of a vehicle is subject to change during loading and unloading due to the action of the vehicle suspension.

Many different systems for loading and unloading vehicles are used, for example ramps, scissor lifts, tail lifts, conveyors and/or dock to vehicle bridging levelling plates which lengthen as vehicle bed height variations increase, are used to counter the problems of varying vehicle bed heights and to endeavour to maintain an accessible gradient between the vehicle and the loading point. Also body and fifth wheel column jacks have been employed to restrain vehicle suspension movement which can be as much as 200mm for vehicles having air suspension systems. The choice is dependent upon the size, weight and packing of goods, dock height and practical time requirements. Vehicle loading is influenced by restrictive angles or gradients formed between the vehicle and the loading point, safety, product fall-off, and limitations of battery power. Known systems can create excessive gradients and dictate use of expensive loading trucks. Also separate trailers can seesaw away from the dock due to load impact on the rear.

Vertical movement of a vehicle during loading or unloading can lead to damage to the vehicle and dock buffers, due to friction. Movable supports are subject to human forgetfullness, misalignment and instability on uneven or soft surfaces.

Dock levelling devices involve considerable construction expense and waste valuable internal warehouse space. Such devices are difficult and costly to uprate. They incur considerable down time during change, repair or servicing as they remain in situ.

The combined costs of devices to resolve problems of goods loading and unloading can be excessive. They often dictate use of power equipment. Difficulty is often experienced during planning in calculating the correct type and size of equipment and dock height which often leads to a restrictive or limiting specification.

An object of this invention is to provide a system which resolves or avoids the difficulties just described without requiring a dedicated internal area of the warehouse, which is capable of being operated with a wide range of vehicles and which is simple and relatively inexpensive to install and use to support and maintain a cargo-support platform of a commercial vehicle or trailer at a desired level for loading or unloading.

According to this invention there is provided a system as defined by claim 1.

Some of the systems for loading and unloading vehicles that are used are intended to tackle other problems. For example, wheel chocks, chains, dock to vehicle crash bar hooking devices, key systems or warning lights are used to inhibit movement of the vehicle in a horizontal direction during loading or unloading, such movement being due to driver error, (the driver forgetting to apply the parking brake or driving off before loading or unloading has been finished), to a trailer moving forward inadvertently or having its front end lift from the ground, or to the momentum of a vehicle loading truck as it impacts the vehicle cargo-support platform. Chains and chocks can lock up due to loading movement. Dock to vehicle crash bar hooking devices have the disadvantage that they allow vertical float of the cargo-support platform relative to the loading point and their position can create problems with tail-lift vehicles.

Accordingly I prefer to incorporate forward movement inhibiting means as defined by claim 2 in a system for supporting and maintaining a cargo-support platform at a desired level for loading or unloading which embodies this invention. Preferably the actuating means are activated by the vehicle as it enters the loading bay and a particular embodiment for achieving that is claimed in claim 17. Other preferred features of the system are defined by the other claims.

Several embodiments of this invention are described now by way of example with reference to the accompanying drawings, of which:-

Figure 1 is a diagrammatic illustration of the rear end of a commercial vehicle in a loading bay into which it has been backed, one form of apparatus in which the present invention is embodied being shown installed in the loading bay in the collapsed or inoperative position it occupies on the road surface of the loading bay prior to reversal of a vehicle over it into the loading bay and driving of the vehicle over it from the loading bay, a partially extended condition of the apparatus being shown chain dotted;

Figure 2 is a view similar to figure 1, with the apparatus shown in figure 1 extended beyond the condition shown chain dotted in figure 1 to engage part of it with the front of the crash bar of the vehicle, the apparatus being shown chain dotted further extended into contact with the underside of the platform of the vehicle which is supported by the vehicle suspension;

Figure 3 is a view similar to figures 1 and 2 with the apparatus fully extended to raise the platform off the vehicle suspension into contact with a bridging plate mounted at the front edge of the working surface of the loading bay;

Figure 4 is a view similar to figure 2 but showing the apparatus modified to include a vertical screw brace for mechanically locking the apparatus in its extended condition;

Figure 5 is a diagrammatic representation of another form of apparatus in which the present invention is embodied, which comprises two separate parts shown installed in the loading bay and in their collapsed or

inactive positions which they occupy on the road surface of the loading bay prior to reversal of a vehicle over them into the loading bay;

Figure 6 is a view similar to figure 5 but with the rear end of a commercial vehicle shown in the loading bay into which it has been backed, the apparatus being shown installed and set in its operational mode for loading or unloading the vehicle;

Figure 7 is a view on arrow A in figure 6 of the apparatus;

Figure 8 is a view similar to figure 5 of part of a further form of apparatus in which the present invention is embodied which is shown in full lines in the collapsed or inoperable position it occupies on the road surface of the loading bay prior to reversal of a vehicle over it into the loading bay, the apparatus being shown chain dotted installed and set in its operational mode for loading or unloading a vehicle (not shown); and

Figure 9 is a view similar to figure 7 of the apparatus shown in figure 8.

Similar parts of the three forms of apparatus in which the present invention is embodied that are illustrated in the accompaying drawings are identified by the same reference characters.

Figure 1 shows the rear portion of an unladen flat topped lorry or trailer 11 which has been backed into a loading bay 12 for loading. The lorry or trailer 11 comprises a cargo-support platform 13, rear wheels 14,

a chassis and a depending crash bar 16 at its rear end.

The loading bay 12 has a working surface 17 which is raised relative to the road surface 18 on which the lorry or trailer 11 is backed into the loading bay 12. A bridging plate 19 is mounted at the edge of the working surface 17 so that it projects beyond that edge. The bridging plate 19 is at the top of structure fitted to the face of the wall of the loading bay 12 that depends from the edge of the working surface 17 to the road surface 18. That structure incorporates a sliding buffer unit 20 which forms the face against which the rear end of the vehicle or trailer 11 is backed as shown in Figure 1. The bridging plate 19 projects beyond the buffer unit 20 so that it projects over the rear edge portion of the cargo-support platform 13 of the vehicle or trailer 11. A sensor is embedded in the working surface 17 under the bridging plate 19 and is adapted to sense distortion or deflection of the bridging plate 19 due to an application of an upwards force on the underside of the projecting portion of the bridging plate 19.

The sliding buffer unit 20 comprises two pairs of side-by-side vertical rods 21 (of which only one is visible in figure 1) which are mounted on the wall of the loading bay 12 that extends between the working surface 17 and the road surface 18. Two buffer pads 22 (of which only one is visible in figure 1) are slidably mounted, one on each pair of rods 21. Each buffer pad 22 rests upon two compression springs 23, each of which is wound around the respective rod 21 and which reacts against a flange 24 at the bottom of

the respective rod. Hence each buffer pad 22 is urged to an intermediate location near the centre of the respective rods 21 either by the respective springs 23 or by gravity.

The remainder of the apparatus in which the present invention is embodied is shown generally at 25 in figure 1. It comprises a hydraulically operated, interlinked, multi-arm vehicle jack and is mounted on the road surface between the rear wheels 14 and the end wall of the loading bay 12. It comprises a ground plate 26, a pedestal 27 pivotally mounted by its bottom on the ground plate 26, a primary arm 28 which is pivotally mounted at one end to the top of the pedestal 27 and a secondary arm 29 which is hinged to the primary arm 28 at its other end. An hydraulic cylinder 30 has its cylinder body pivotally mounted on the ground plate 26 and its ram hinged to the primary arm 28. Another hydraulic cylinder 31 has its cylinder body pivotally mounted on the ground plate 26 and its ram hinged to the secondary arm 29. Chassis support pads 32 are pivotally mounted to the end of the secondary arm 29 remote from the primary arm 28.

The system is provided with suitable operating means such a manual lever, an electrical control system including its own power pack activatable and controllable by the operation of push buttons to control extension and contraction of the hydraulic cylinders; the vehicle stop mechanism including the buffer unit 20 or means operable by the reversing vehicle.

Prior to reversal of the vehicle or trailer 11 into the loading bay 12 the leveling jack apparatus 25 is in its collapsed state as shown in full lines in figure 1, the hydraulic cylinder 30 being contracted and the hydraulic cylinder 31 being extended. In that condition the whole of the levelling jack apparatus 25 is below the level of the bottom of the crash bar 16. Hence as the vehicle or trailer 11 is reversed into the loading bay 12, the bottom of the crash bar 16 passes over the apparatus 25.

The vehicle or trailer 11 is backed into the loading bay until its rear end abuts the buffer pads 22. Operation of the apparatus 25 is then initiated by the means provided and that operation comprises the following sequence of steps. The hydraulic cylinder 31 is contracted to pull the secondary arm 29 towards the ground plate 26. This causes the two arms 28 and 29 to crab and the pedestal 27 to seat upon the ground plate 26 as shown chain dotted in figure 1. The cylinder 30 is raised by that movement and is then extended to pivot the primary arm 28 up and over centre to the position shown in full lines in figure 2 in which it abuts the front of the crash bar 16. The primary arm 28 is held in that position by the extended hydraulic cylinder 30 and restricts horizontal movement of the vehicle or trailer 11 out of the loading bay 12. The hydraulic cylinder 31 is raised by that movement from its position shown chain dotted in figure 1 to its position shown in full lines in figure 2, whereafter it is extended to lift the secondary arm 29 to bring the chassis support pads 32 into contact with the underside of the chassis as shown chain-dotted in Figure 2. Further extension of the hydraulic cylinder 31 raises the cargo-support

platform 13 until it is brought into abutment with the underside of the bridging plate 19 (see Figure 3) at which there is substantial alignment between the working surface 17 and the surface of the support platform 13. Abutment of the cargo-support platform 13 with the bridging plate 19 will be sensed by the sensor which will respond by initiating cessation of further extension of the hydraulic cylinders 30 and 31. It will be understood that the hydraulic cylinders 30 and 31 prop the cargo-support surface so that any tendancy for the latter to sag as it is loaded is countered. The sliding buffer pads 22 slide up their respective rods 21 thus prevently frictional damage to the vehicle or bumper.

Pad braces 33 may be positioned as shown in figure 4, if required.

When the vehicle has been loaded or unloaded and is to be driven away from the loading bay, the apparatus 25 is contracted, the sequence of operation being the reverse of that just described.

Hence the apparatus in which this invention is embodied that has just been described with reference to figures 1 to 4 will restrain vertical and horizontal movement of the vehicle 11, support and lift the cargo-support platform 13 of that vehicle to level with the raised goods loading surface 17 and provide a bridge between the vehicle and that loading surface 17. The chassis support pads 32 can be fitted with various adaptor plates to vary heights, spread loading, mate with the chassis and increase or decrease friction between the pad and the underside of

the vehicle chassis members by mechanical or other means.

An interlinked multi-arm jack arrangement comprising just the primary and secondary arms and two hydraulic cylinders, and not including the pivotally mounted pedestal could be used instead of the apparatus 25 shown in Figures 1 to 4. The primary arm of such an alternative arrangement would be pivotally mounted on the ground plate coaxially with the hydraulic cylinder that has its rod pinned to the secondary arm. The other hydraulic cylinder, which has its rod pinned to the primary arm would be pivotally mounted on the ground plate at a location on the ground plate which is further from the end wall of the loading bay than is the pivot mounting of the primary arm. The secondary arm would be pinned to the rod of the respective hydraulic cylinder by a pin in a slot connection which allows for some limited relative movement between the rod and the secondary arm.

Figure 5 shows another form of apparatus in which this invention is embodied. The apparatus comprises a levelling jack arrangement 42 and a vehicle stop arm arrangement 43 which are mounted on separate bases 44 and 45 on the road surface 18 so as to be between the rear wheel of a vehicle which is backed into the loading bay 12 and the end wall of the loading bay 12.

Figures 5 to 7 show the levelling jack arrangement 42 comprises a spaced pair of hydraulic cylinders 46 and 47 which are mounted by the closed ends of their cylinder bodies on a base plate 48 which is pivotally mounted on the respective base 44 by its long edge

which is further from the end wall of the loading bay 12. A beam 49 bridges the rams of the two hydraulic cylinders 46 and 47. A striker arm 51 is fixed at one end to the base plate 48 near the pivot axis thereof and projects between the two cylinders 46 and 47 towards the end wall of the loading bay 12. The striker arm 51 is at an acute angle to the base plate 28. The length of the striker arm 51 is such that its upper end is below the bottom of the crash bar 16 when the hydraulic cylinders 46 and 47 are upright as shown in Figures 6 and 7, but is sufficient for it to project to a height which is greater than the clearance between the bottom of the crash bar 16 and the road surface 18, when the bridge structure formed by the hydraulic cylinders 46 and 47 and the beam 49 is pivoted to its inoperative position in which the cylinders 46 and 47 lie upon the base 44, as shown in Figure 5.

The vehicle stop arm arrangement 43 comprises a cranked arm 52 which is pivotally mounted in a clevis 53 which in turn is mounted on the base 45. A hydraulic cylinder 54 is pivotally mounted by the closed end of its cylinder body on the base 45 and has its rod pinned to the cranked arm 52. Contraction of the hydraulic cylinder 54 pivots the cranked arm 52 down to the base 45, as shown in Figure 5. Extension of the hydraulic cylinder 54 raises the cranked arm into abutment with the forward edge of the crash bar 16 as shown in Figure 6. The length of the cranked arm 52 is sufficient to ensure that the forward edge of the crash bar 16 abuts it even when the cargo-support platform 13 of the vehicle or trailer 11 is in abutment with the underside of the bridging plate 19.

Prior to reversal of the vehicle or trailer 11 into the loading bay 12, the levelling jack arrangement 42 and the vehicle stop arm arrangement 43 are in their collapsed positions shown in Figure 5. In that condition the whole of the levelling jack arrangement 42, except the striker arm 51, and the whole of the vehicle stop arm arrangement 43 are below the level of the bottom of the crash bar 16. Hence, as the vehicle or trailer 11 is reversed into the loading bay 12, the bottom of the crash bar 16 passes over the beam 49 and the cylinders 46 and 47, into abutment with the striker arm 51. Thus the bridge structure is pivoted from its collapsed condition shown in Figure 5 to the upright condition shown in Figures 6 and 7 because the striker arm 51 will be pushed forward by the crash bar 16, the remainder of the levelling jack arrangement 42 being raised behind the crash bar 16 and in front of the rear wheels 14 without fouling the wheels 14.

The vehicle or trailer 11 is backed up into contact with the buffer unit 20, as shown in Figure 1, passing over the collapsed vehicle stop arm arrangement 43 in so doing. Once in abutment with the buffer unit 20, the vehicle brakes are applied. The system is then operated, either manually by a lever, electrically through a power pack, or automatically in reaction to the reversing movement of the vehicle, in consequence of contact with the striker arm 51 or abutment with the buffer unit 20, so as to extend the hydraulic cylinders 46 and 47, to bring the beam 49 into contact with the underside of the chassis, and to extend the hydraulic cylinder 54 to bring the cranked arm 52 up against the crash bar 16. The hydraulic cylinders 46 and 47 extend to raise the chassis and take the weight thereof from the vehicle suspension.

The cylinders 46 and 47 continue to extend raising the cargo-support platform 13 until it is brought into abutment with the underside of the bridging plate 19 at which there is substantial alignment between the working surface 17 and the surface of the support platform 13. Abutment of the cargo-support platform 13 with the bridging plate 19 will be sensed by the sensor which will respond by initiating cessation of further extension of the hydraulic cylinders 46 and 47. It will be understood that the hydraulic cylinders 46 and 47 prop the cargo-support surface so that any tendancy for the latter to sag as it is loaded is countered.

Operation of the invention is not limited to unladen vehicles. The steps prior to loading are also carried out prior to unloading a loaded vehicle. As the jack arrangement 42 is supporting the vehicle chassis instead of the vehicle suspension, there will not be a tendancy for the cargo-support platform to rise as it is unloaded.

The hydraulic jacks 46, 47 and 54 would be contracted, and thus the cranked arm 52 would be lowered, before the vehicle or trailer 11 is driven out of the loading bay 12. The bridge portion of the levelling jack arrangement 42 would be deflected to its collapsed position by the crash bar 16 as the vehicle or trailer 11 is driven away from the end wall of the loading bay 12, the striker arm 51 following the crash bar 16 as the bridge portion is moved to the collapsed position.

The hydraulic jacks 46, 47 and 54 would be connected into a hydraulic control system which incorporates a pump or other suitable source of hydraulic fluid pressure, and suitable control valves associated with the sensor in the bridging plate 19 and the actuating means previously mentioned. The two hydraulic cylinders 46 and 47 would be interlinked so that the beam 49 tends to level the platform 13. A flow compensating valve may be provided in the connection to those two cylinders 46 and 47.

It will be appreciated the levelling jack arrangement 42 does not have to be used in conjunction with the vehicle stop arm arrangement 43 : any other suitable device for restraining undesired movement of the vehicle or trailer 11 away from the end wall of the loading bay could be used.

It will be noted that the striker arm 51 passes below the crash bar 16 when the levelling jack arrangement 42 is raised and thus serves as a stop which cooperates with the crash bar 16 to inhibit undesired collapsing of the levelling jack arrangement 42 before the vehicle is driven out of the loading bay 12.

Figures 8 and 9 illustrate another form of apparatus in which this invention is embodied which, like the form shown in figures 5 to 7, comprises a levelling jack arrangement 62 and a vehicle stop arm arrangement 63 which are separate one from the other, but the base 65 of the latter extends through a gap in the angled base plate 68 and over the base 64 of the former.

In addition to the pivoted base plate 68 of the levelling jack arrangement 62 being in two spaced parts, there are two similar striker arms 71, each mounted on a respective pivoted base plate part as can be seen from Figure 9. The construction of the remainder of the levelling jack arrangement 62 is the same as for the corresponding parts of the arrangement 42 as is its operation.

The vehicle stop arm arrangement 63 has a straight stop arm 72 in place of the cranked arm 52 of the arrangement 43. The stop arm 72 has a generally C-shaped cross-section and conveniently comprises two opposed lengths of channel section joined together on one side by a rectangular plate. The flanges of the channel sections are running surfaces for rollers 75 (see Figure 9) which are fitted to the end of the ram of the hydraulic cylinder 74. Hence the end of the ram of the hydraulic cylinder 74 is constrained for rectilinear movement in the stop arm 72, which is pivotally mounted at one end. The stop arm arrangement 63 can be moved back and forth relative to the levelling jack arrangement 62 during installation in a loading bay to suit the particular application.

CLAIMS

1. A system for supporting and maintaining a cargo-support platform (13) of a commercial vehicle or trailer at a desired level for loading or unloading including jacking means (25, 42, 62) operable to be extended to support the platform (13) against vertical movement on the vehicle suspension, characterised in that the jacking means (25, 42, 62) are collapsible and are operable to be extended to support the platform (13) against vertical movement during loading or unloading, there being actuating means (16 and 51 or 71) operable to initiate extension of the jacking means (25, 42, 62) from the collapsed state and subsequently to restore the jacking means (25, 42, 62) to the collapsed state, and control means operable to control extension of the jacking means (25, 42, 62) whereby to establish and maintain the desired level of the cargo support platform (13) during loading.

2. A system according to claim 1, including forward movement inhibiting means (28, 52, 72) adapted to coact with crash bar structure (16) which depends from the platform (13) at its rear to inhibit forward movement of the vehicle or trailer when the platform (13) is supported by the extended jacking means (25, 42, 62).

3. A system according to claim 1 or claim 2, wherein the collapsible jacking means (25, 42, 62) is designed to be installed on a road surface (18) of a loading area (12), the height of the jacking means (25, 42, 62) in its collapsed state being less than the clearance between the road surface (18) and crash bar

structure (16) which depends from the platform (13) at its rear, the jacking means (25, 42, 62) being extendable from its collapsed state into engagement with the underside of the vehicle or trailer to support the platform (13).

4. A system according to claim 3, wherein the jacking means (25, 42, 62) includes a pivot mounting by which it is installed on the road surface (18), extension of the jacking means (25, 42, 62) from its collapsed state and contraction to its collapsed state comprising angular movement of at least part (27-29, 46-49) of the jacking means (25, 42, 62) about said pivot mounting.

5. A system according to claim 2 or either of claims 3 and 4 when appended to claim 2, wherein said forward movement inhibiting means comprise an arm (28, 52, 72) having a pivot mounting which is designed to be installed on the road surface (18) of a loading area (12), the arm (28, 52, 72) having an inoperative position in which its height is less than the clearance between the road surface (18) and the crash bar structure (16), and being pivotable to an operative position in which it abuts the forward face of the crash bar structure (16), there being extensable support means (30, 54, 74) operable to be extended to prop the arm (28, 52, 72) in its operable position whereby to inhibit forward movement of the vehicle of the trailer.

6. A system according to claim 5 when appended to claim 3, wherein the arm (28), its pivot mounting, and said extensable support means (30) are incorporated in said collapsible jacking means (25), the arrangement

of the jacking means (25) being such that extension of the support means (30) to pivot the arm (28) from its inoperative position to its operative position is part of, or is caused by, extension of the jacking means (25) from its collapsed state into engagement with the underside of the vehicle or trailer.

7. A system according to claim 5 when appended to claim 3, wherein the pivot mounting of the arm (52, 72) is designed to be installed on the road surface (18) at a location which is displaced from the jacking means (42, 62) in the direction in which a vehicle is backed over the jacking means (42, 62) prior to unloading and/or loading.

8. A system according to any one of claims 5 - 7, wherein the support means (30, 54, 74) comprise a hydraulic cylinder which is operable to pivot the arm (28, 52, 72) between its operative and its inoperative position.

9. A system according to claim 7 or claim 8 when appended to claim 7, wherein the mounting (43, 45, 63) by which the arm (52, 72) is installed on the road surface is physically separate from the mounting (44) by which the jacking means (42, 62) is installed on the road surface (18).

10. A system according to any one of claims 1 to 9, wherein the desired level is the level of a working surface (17) of a loading bay (12) which is raised relative to a road surface (18) on which the vehicle or trailer is backed into the loading bay (12), and including a bridging plate (19) which is designed to be installed on the working surface (17) of the

loading bay (12) and to project therefrom so as to bridge a gap between the working surface (17) and the cargo support platform (13) of the vehicle or trailer which has been backed into the loading bay for unloading or loading, the control means including sensing means for sensing abutment of the bridging plate (19) by the cargo support platform (13) and being operable to cause or allow extension of the jacking means (25, 42, 62) wherever such abutment is not sensed and to inhibit extension of the jacking means (25, 42, 62) when such abutment is sensed.

11. A system according to any one of claims 1 to 10, wherein the jacking means (42, 62) comprise a pair of pivotally mounted hydraulic cylinders (46 and 47) and a beam (49) which bridges the cylinders (46 and 47) at their ends remote from their pivot mountings, the hydraulic cylinders (46 and 47) being connected to a common source of hydraulic fluid pressure.

12. A system according to claim 11, including flow compensating valve means in the hydraulic fluid circuit comprising the two hydraulic cylinders (46 and 47) and the common source of hydraulic fluid pressure.

13. A system according to any one of claims 1 to 12, wherein the desired level is the level of a working surface (17) of a loading bay (12) which is raised relative to a road surface (18) on which the vehicle or trailer is backed into the loading bay (12), and further including buffer means (20) for abutment by the rear of the cargo support platform (13) of a vehicle or trailer which is backed into the loading bay (12), the buffer means (20) being mounted for

sliding movement, up or down, on an end wall of the loading bay (12) below the bridging plate (19) so as to move up with any upward movement of the platform (13) which occurs as the jacking means (25, 42, 62) is extended.

14. A system according to any one of claims 1 to 13, wherein a screw brace arrangement (33) is associated with the collapsible jacking means (25), the screw brace arrangement (33) being for installation between the parts (32) of the jacking means (25) that engage the underside of the cargo support platform (13) and the road surface (18) therebelow, whereby to mechanically lock the jacking means (25) in its extended condition.

15. A system according to any one of claims 1 to 14, wherein the actuating means comprise a manually operable lever.

16. A system according to any one of claims 1 to 14, wherein the actuating means comprise a push button operable electrical system, including an electrical power pack, for controlling operation of one or more hydraulic cylinders.

17. A system according to any one of claims 1 to 14, wherein the actuating means comprise abutment means (51, 71) adapted to be abutted by a corresponding part (16) of the vehicle or trailer as the latter is backed into position over the collapsible jacking means (42, 62) for unloading or loading, the abutment means (51, 71) being adapted to respond to abutment by the vehicle or trailer to initiate extension of the jacking means (42, 62) from the collapsed state.

18. A system according to claim 4, or any one of claims 5, 6, 8 and 10 to 14 when appended to claim 4, wherein the actuating means comprise an arm (51, 71) which projects from the remainder of the jacking means (42, 62) for engagement by the crash bar structure (16) as the vehicle is being backed into the loading area (12) whereby the jacking means (42, 62) are pivoted about their pivot mounting and raised from their collapsed condition under the vehicle or trailer.

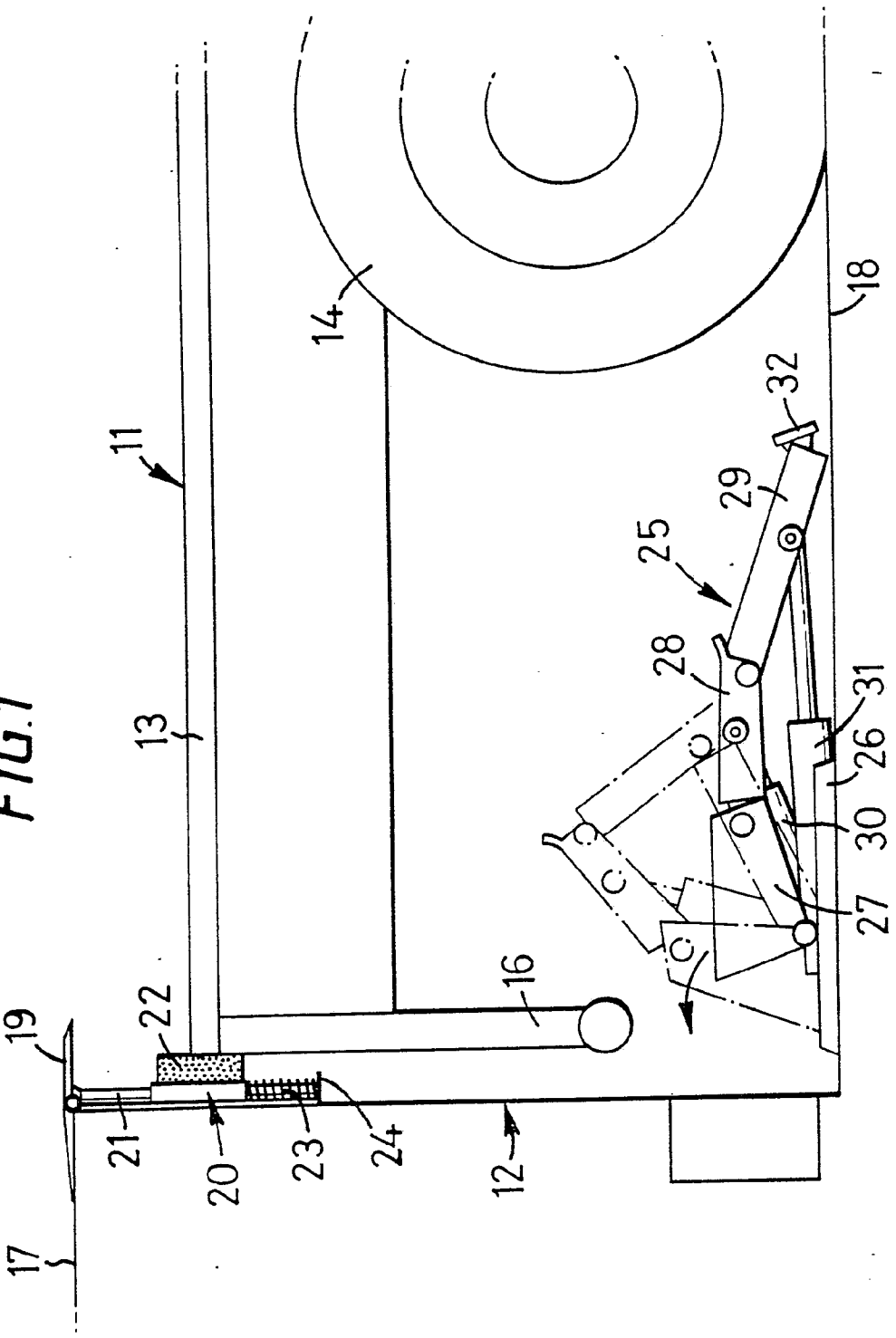

FIG.1

FIG.3

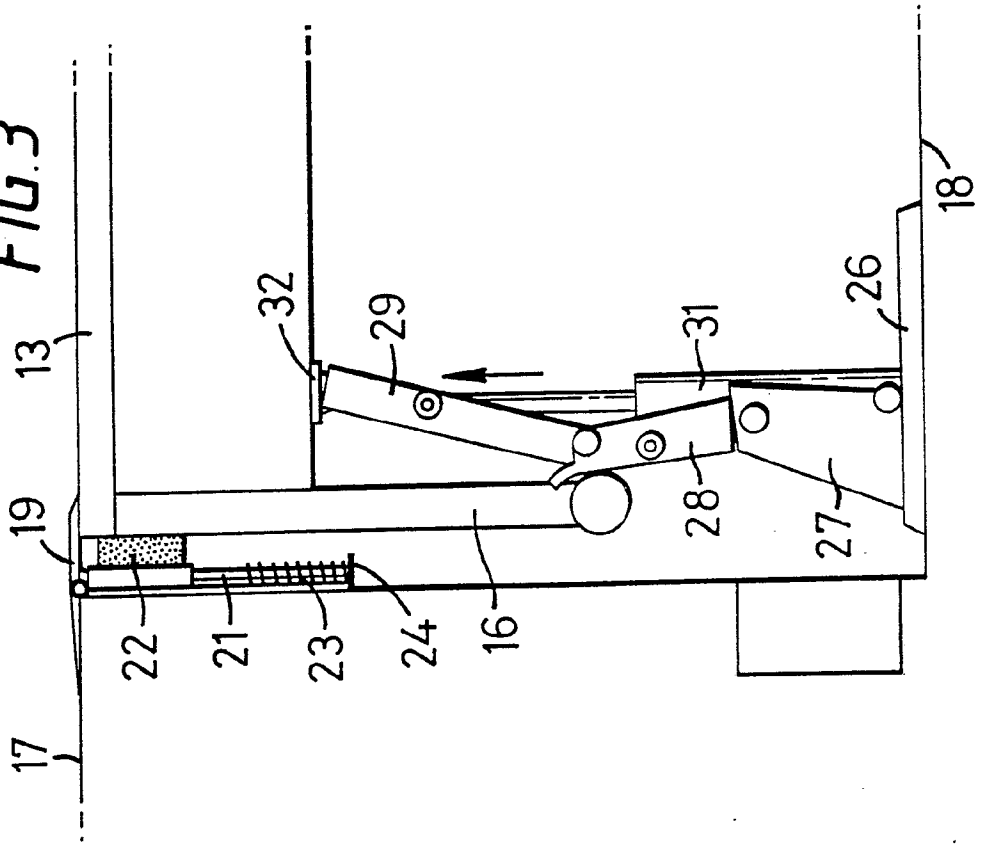
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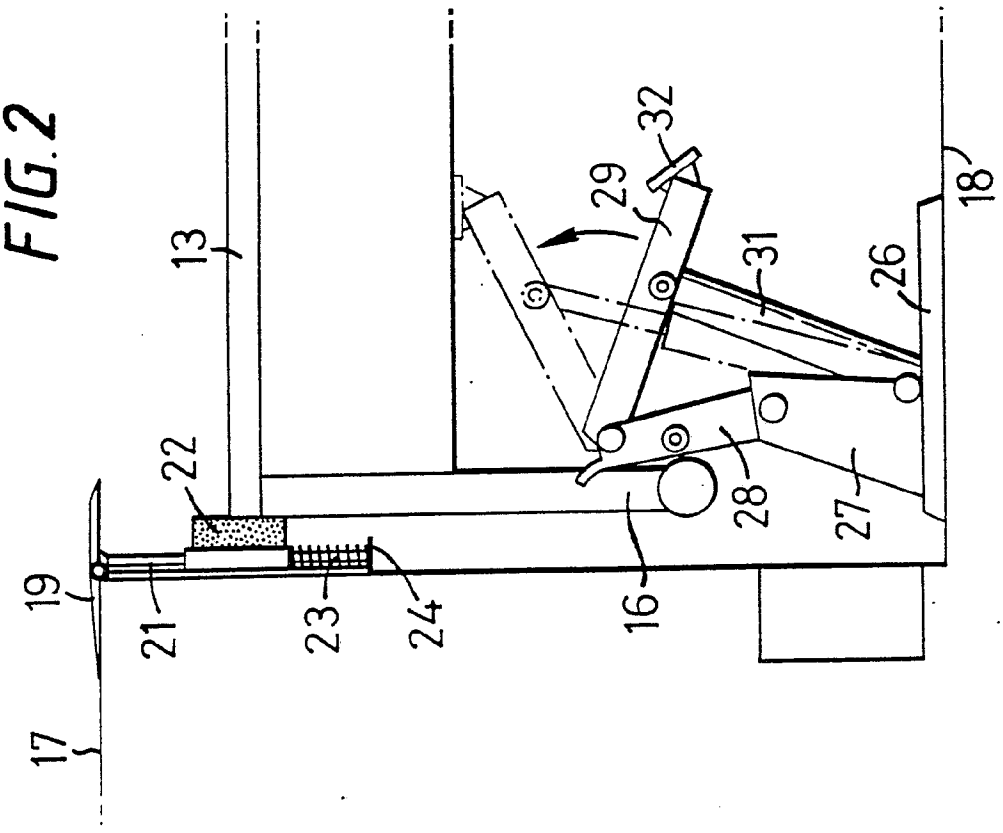
FIG.2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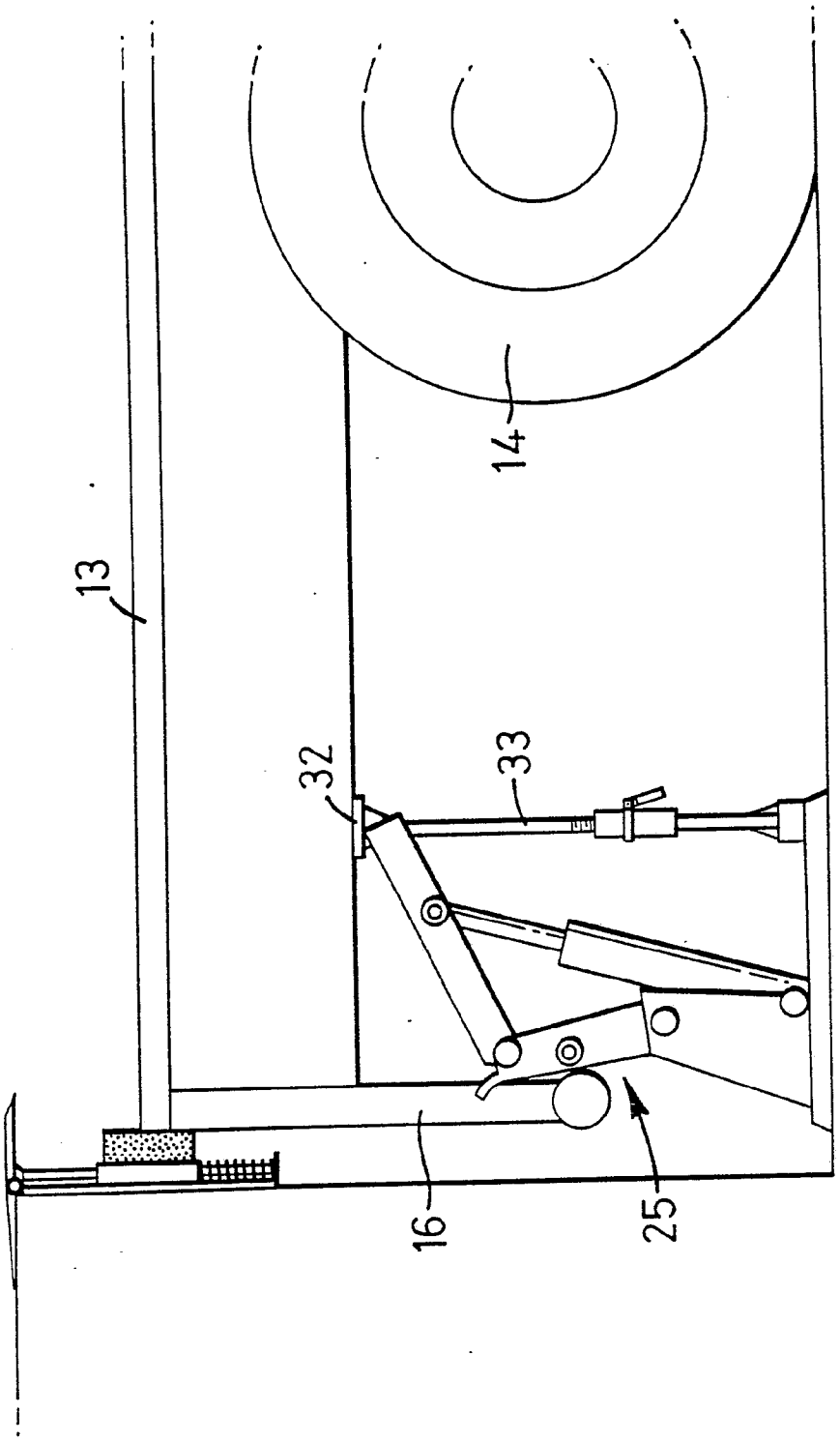

FIG.4

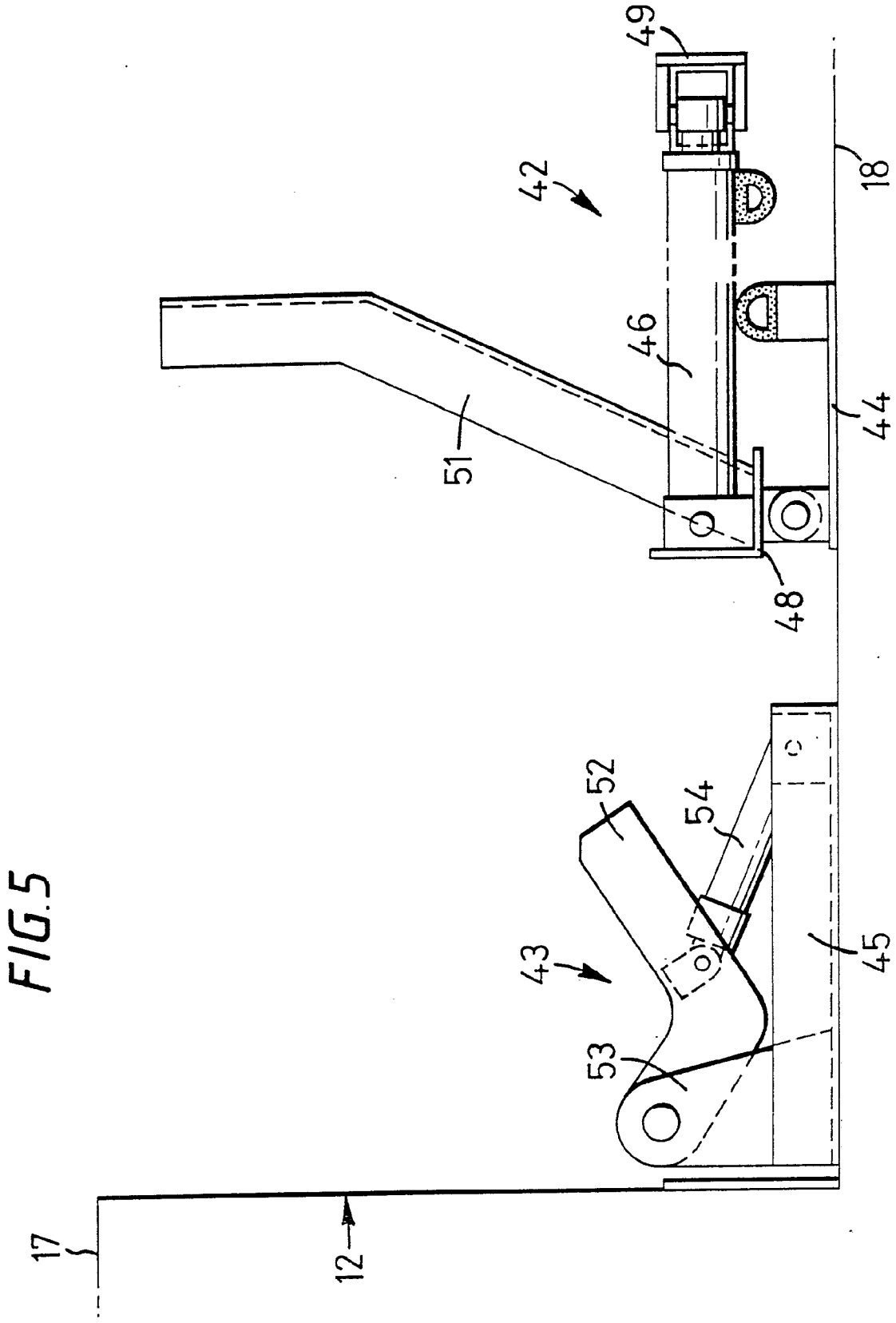

FIG.5

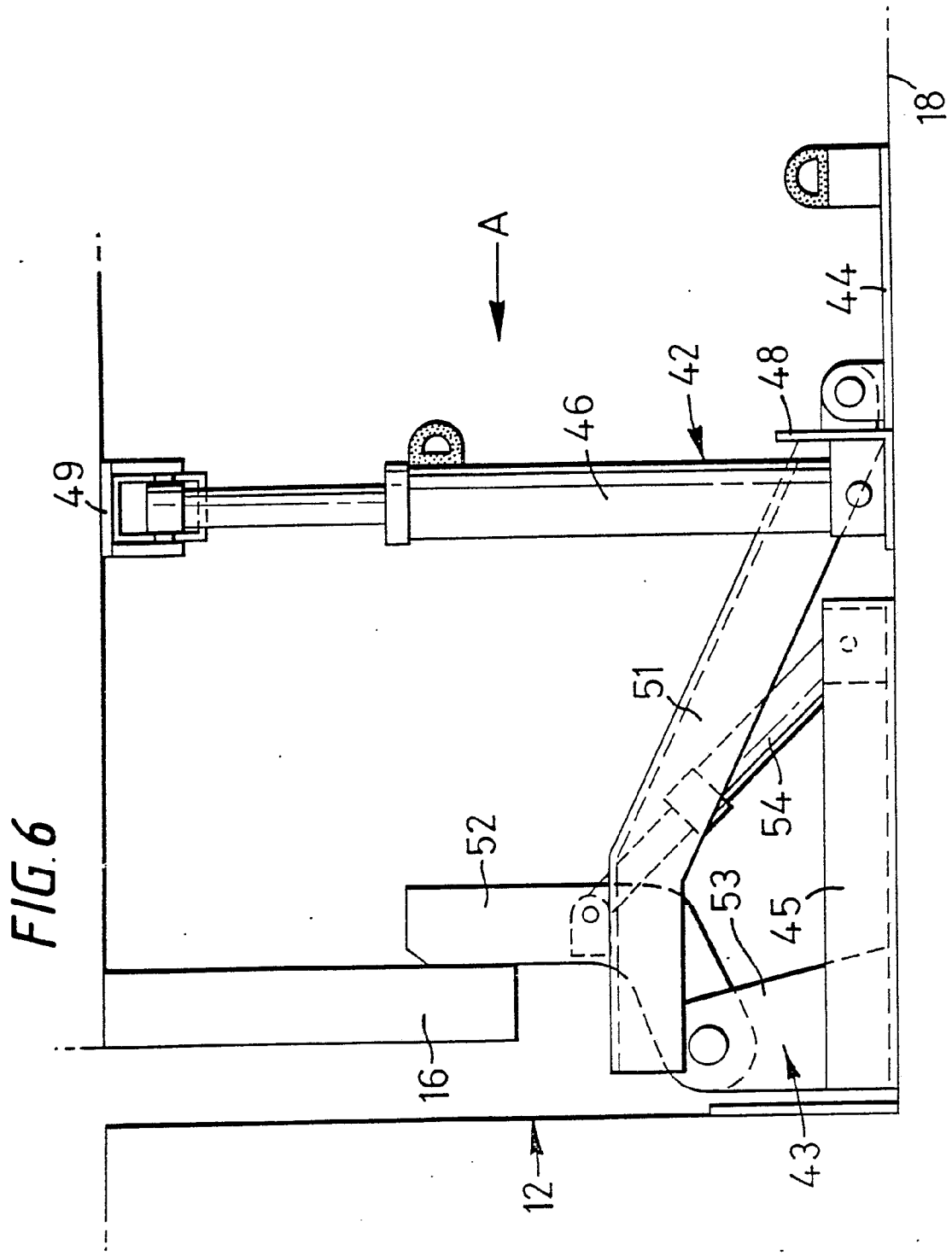

FIG.6

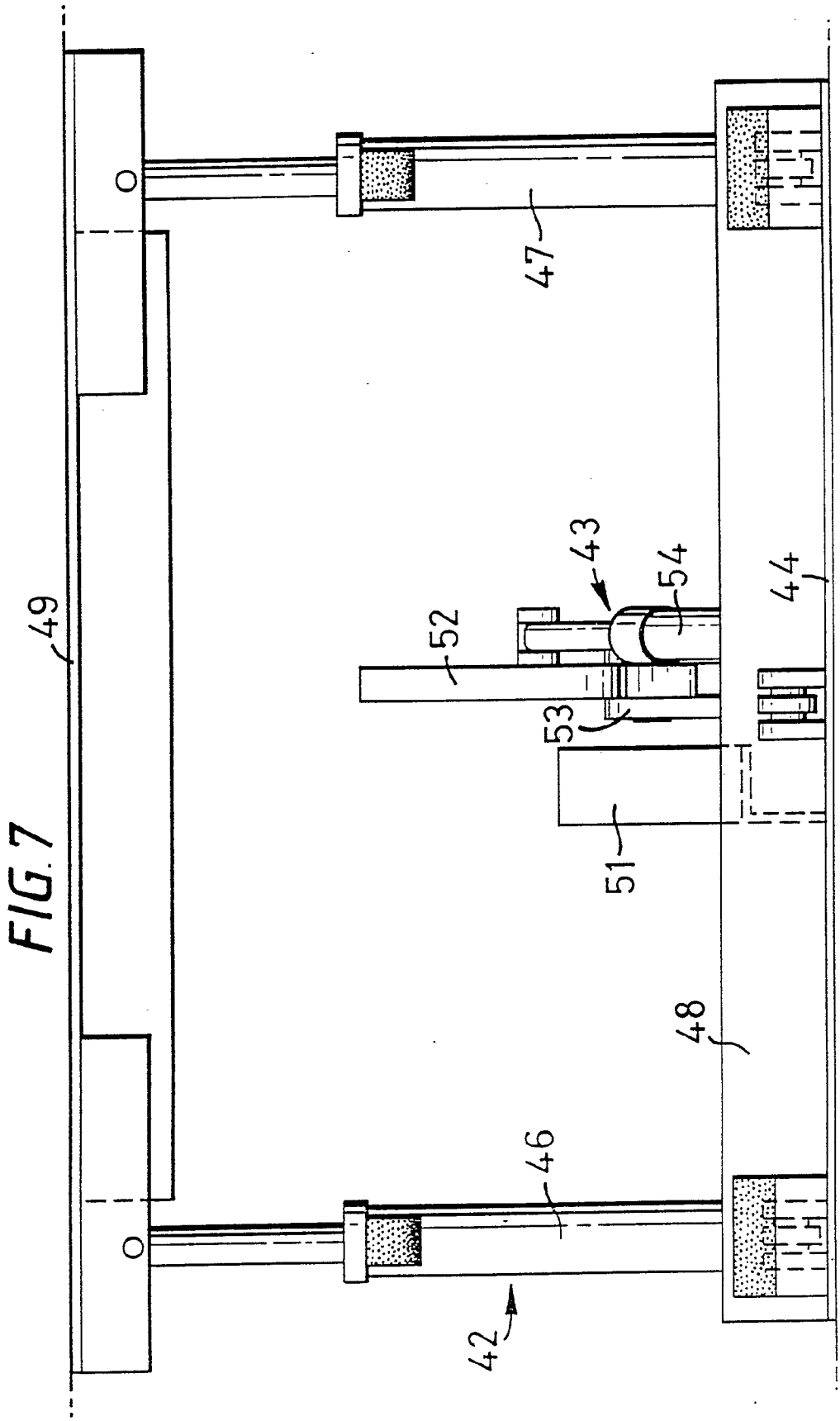

FIG. 7

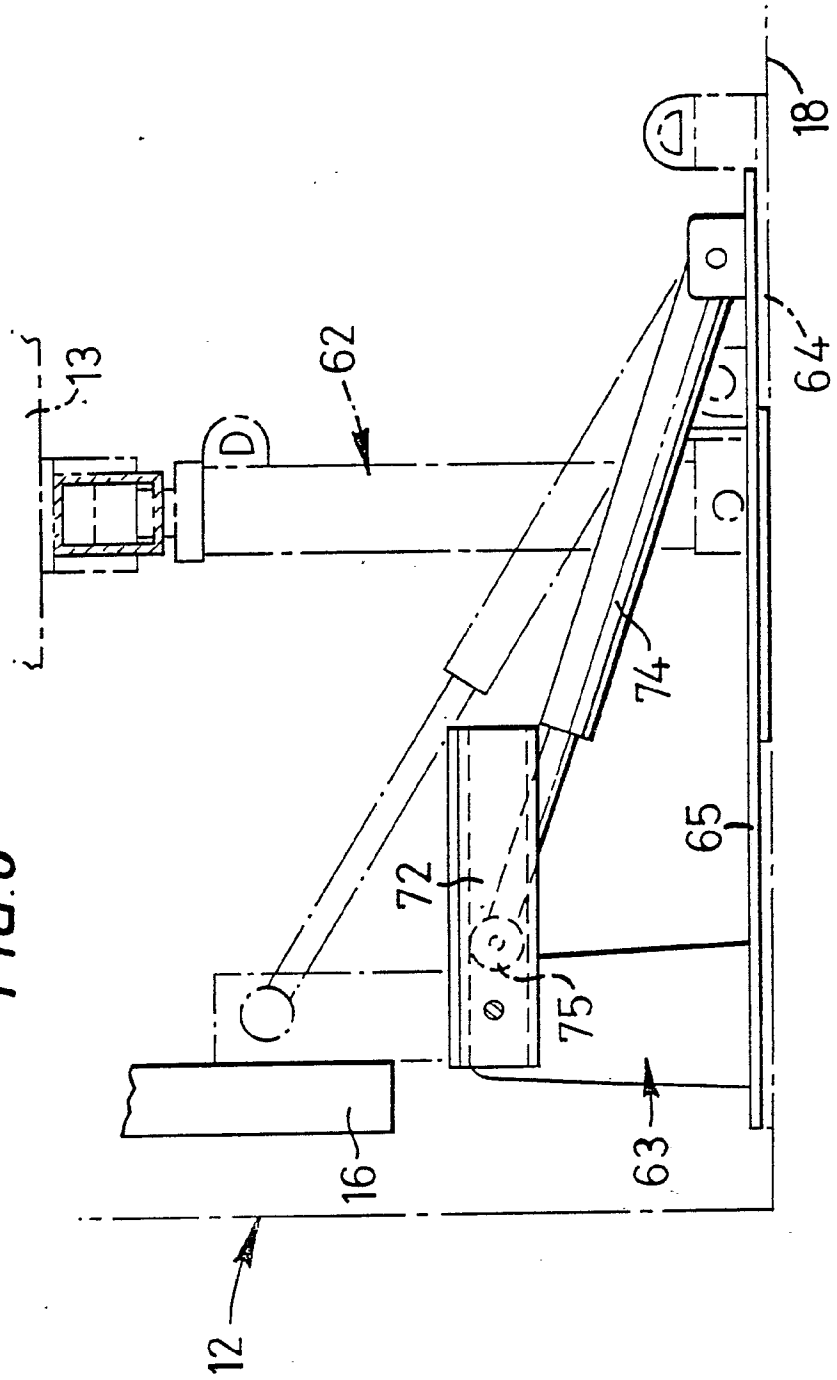

FIG.8

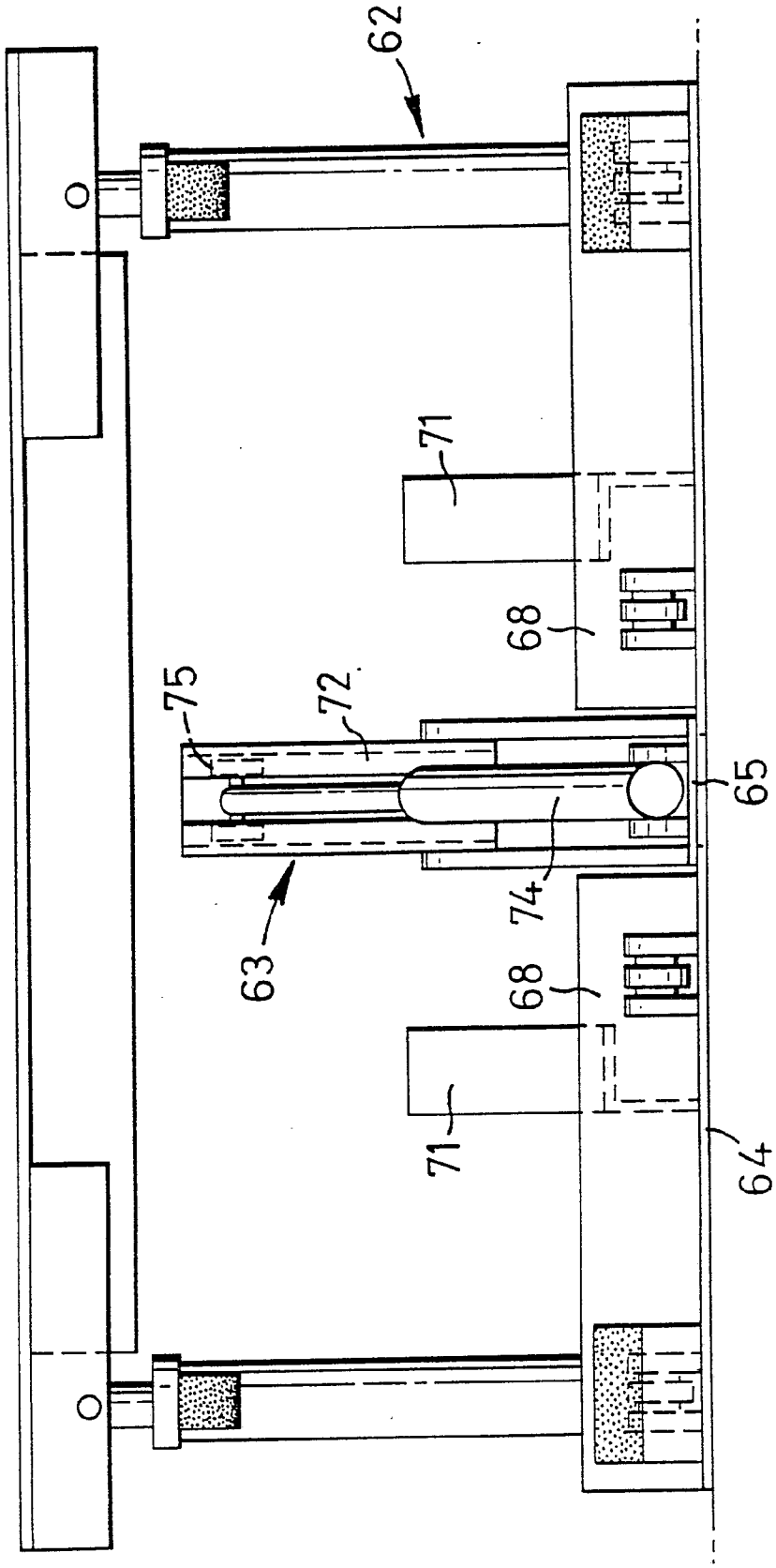

FIG.9

INTERNATIONAL SEARCH REPORT

International Application No PCT/GB 88/00307

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [6]

According to International Patent Classification (IPC) or to both National Classification and IPC

IPC[4]: B 65 G 67/02

II. FIELDS SEARCHED

Minimum Documentation Searched [7]

Classification System	Classification Symbols
IPC[4]	B 65 G

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched [8]

III. DOCUMENTS CONSIDERED TO BE RELEVANT [9]

Category *	Citation of Document, [11] with indication, where appropriate, of the relevant passages [12]	Relevant to Claim No. [13]
Y	US, A, 4624446 (R.R. GOULD) 25 November 1986 see figures 1-4; column 2, line 30 - column 3, line 37; column 4, lines 4-51 --	1-13,17
Y	US, A, 4488325 (D.E. BENNETT) 18 December 1984 see the whole document	1-13,17
A	--	16,18
A	FR, A, 2453781 (J. BEKAERT) 7 November 1980 see the whole document, especially claim 4	14,15

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* Special categories of cited documents: [10]

"A" document defining the general state of the art which is not considered to be of particular relevance

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
6th July 1988	21 JUIL. 1988
International Searching Authority: EUROPEAN PATENT OFFICE	Signature of Authorized Officer: P.C.G. VAN DER PUTTEN

ANNEX TO THE INTERNATIONAL SEARCH REPORT ON INTERNATIONAL PATENT APPLICATION NO. GB 8800307 SA 21768

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 12/07/88 The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A- 4624446	25-11-86	None	
US-A- 4488325	18-12-84	CA-A- 1191303	06-08-85
FR-A- 2453781	07-11-80	None	